Listing of Claims

1.   (Previously Presented) A method for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards, each of the plurality of boards coupled to an input/output bus and having a plurality of input/output ports for transmitting/receiving state information, comprising:

monitoring state information of first and second boards using the plurality of input/output ports, wherein the state information is provided to each of the first and second boards through the input/output ports connecting the first board to the second board;

determining an active or standby state of each of the first and second boards according to the monitored state information;

generating information to transfer an active authority to the second board, and forming presently processed data of the first board into ATM cell information, when the second board is required to assume the active state; and

switching the duplexing to the second board according to the ATM cell information, wherein the ATM cell information comprises a virtual path and a virtual channel, and wherein the virtual path is 0 and the virtual channel is 0 when there is no change to the active and standby states between the first and second boards, and change to update information or software occurs during an operation of the ATM system.

2.   (Previously Presented) A method for controlling duplexing in an ATM system, the ATM system including a plurality of duplexing control boards, each of the plurality of boards coupled to an input/output bus and having a plurality of input/output ports for transmitting/receiving state information, comprising:

monitoring state information of first and second boards using the plurality of input/output ports, the input/output ports connecting the first and second boards by bypassing the input/output bus;

determining an active or standby state of each of the first and second boards according to the monitored state information;

generating information to transfer an active authority to the second board, and forming presently processed data of the first board into ATM cell information, when the second board is required to assume the active state; and

switching the duplexing to the second board according to the generated information in the form ATM cell information, wherein a state of an MS port determines whether a board is the first board or the second board when the board is mounted to pins of a backboard of the ATM system.

3.   (Previously Presented) The method of claim 1, wherein a recognition of and a conversion between the active state and the standby state are carried out by recognizing a state of each board.

4.   (Previously Presented) A method for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards, each of the plurality of boards

coupled to an input/output bus and having a plurality of input/output ports for

transmitting/receiving state information, comprising:

monitoring state information of first and second boards using the plurality of

input/output ports;

determining an active or standby state of each of the first and second boards

according to the monitored state information;

generating information to transfer an active authority to the second board, and

forming presently processed data of the first board into ATM cell information, when the second

board is required to assume the active state; and

switching the duplexing to the second board according to the generated

information in the form ATM cell information, wherein the ATM cell comprises a header to

indicate a destination of transmitted data and a payload containing data information, the payload

having first and second three bytes segments, in which two bits indicate node information, four

bits indicate slot information, three bits indicate port information, and eight bits indicate virtual

channel and virtual path information.

5.   (Previously Presented) The method of claim 1, wherein the virtual path is 0 and

the virtual channel is 255 when the first board is in the active state, and wherein the virtual path

is 1 and the virtual channel is 255 when the second board is in the active state.

6.   (Canceled)

7.   (Previously Presented) A method for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards, each of the plurality of boards

coupled to an input/output bus and having a plurality of input/output ports for

transmitting/receiving state information, comprising:

        monitoring state information of first and second boards using the plurality of

input/output ports;

        determining an active or standby state of each of the first and second boards

according to the monitored state information;

        generating information to transfer an active authority to the second board, and

forming presently processed data of the first board into ATM cell information, when the

second board is required to assume the active state; and

        switching the duplexing to the second board according to the generated

information in the form ATM cell information, wherein a CARDNOR signal is changed from

"1" to "0" when the first board cannot perform a normal operation, and wherein the second

board converts a state of a PAIRDIS of the second board to "1", to reset the first board and

switch the state of the second board into the active state, when one of a PAIRACT signal and a

PAIRNOR signal of the first board becomes "0" so as to transfer the active authority from the

first board to the second board for the switching of duplexing.

8.   (Original) The method of claim 7, wherein the second board switches the state of

the PAIRDIS to "0" to release the reset of the first board after the second board is converted

into the active state, and sets the master board to the standby state when the state of a

ACTOWN signal and a CARDNOR signal of the second board is "1".

9.   (Previously Presented) A method for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards, each of the plurality of boards

coupled to an input/output bus and having a plurality of input/output ports for

transmitting/receiving state information, comprising:

        monitoring state information of first and second boards using the plurality of

input/output ports;

        determining an active or standby state of each of the first and second boards

according to the monitored state information;

generating information to transfer an active authority to the second board, and

forming presently processed data of the first board into ATM cell information, when the

second board is required to assume the active state; and

switching the duplexing to the second board according to the generated

information in the form ATM cell information, wherein information of an MS port of the

second board is analyzed through an MS port of the first board, and when the second board is in

the standby state, the active state of the first board is recognized and reported through an

ACTOWN port to the second board upon an initialization of the system.

10.   (Previously Presented) A method for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards, each of the plurality of boards

coupled to an input/output bus and having a plurality of input/output ports for

transmitting/receiving state information, comprising:

monitoring state information of first and second boards using the plurality of

input/output ports, the input/output ports connecting the first and second boards by bypassing

the input/output bus;

determining an active or standby state of each of the first and second boards

according to the monitored state information;

generating information to transfer an active authority to the second board, and

forming presently processed data of the first board into ATM cell information, when the second

board is required to assume the active state; and

switching the duplexing to the second board according to the generated

information in the form ATM cell information, wherein the state of the first board is confirmed

when the second board is initially mounted to slots and is maintained in the standby state, and

the second board maintains its standby state when the first board is in the active state, and

wherein the second board is operated in the active state and informs the first board of its state

through an ACTOWN port when the master board is in the standby state.

11.   (Previously Presented) A method for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards, each of the plurality of boards

coupled to an input/output bus and having a plurality of input/output ports for

transmitting/receiving state information, comprising:

monitoring state information of first and second boards using the plurality of

input/output ports, the input/output ports connecting the first and second boards by bypassing

the input/output bus;

determining an active or standby state of each of the first and second boards

according to the monitored state information;

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generating information to transfer an active authority to the second board, and

forming presently processed data of the first board into ATM cell information, when the second

board is required to assume the active state; and

switching the duplexing to the second board according to the generated

information in the form ATM cell information, wherein, when two duplexing boards are

mounted to slots, a first board, which is not maintained in the active state, requests state

information from a second board maintained in the active state through the ATM cell

information, and wherein the second board in the active state forms state information of the

second board into an ATM cell information, and transfers the ATM cell information to the first

board.

12.   (Previously Presented) A system for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards connected to an input/output bus,

comprising:

a first interface circuit configured to couple with an input bus to interface a

received ATM cell;

a second interface circuit configured to couple with an output bus to interface a

transmitted ATM cell;

a cell disassembling and assembling circuit to disassemble and assemble a data unit contained in an application layer in the transmitted/received ATM cell by a unit of ATM cell;

a control circuit detect a signal from the cell disassembling and assembling circuit, wherein the control circuit maintains an active state when a first board is provided active authority by the signal;

a plurality of input/output ports to transmit/receive state information; and

a memory to store data transmitted/received for the switching of duplexing between the boards, wherein the plurality of input/output ports comprise:

an ACTOWN port to inform a second board of information as to whether a first board maintains the active state or the standby state;

a PAIRACT port coupled to the ACTOWN port, to recognize if the second board is maintained in the active state or the standby state;

a PAIRDIS port to output a signal to reset the second board;

a CARDDIS port coupled to the PAIRDIS port, the CARDDIS port resetting the first board when a reset signal is applied from the PAIRDIS port;

a CARDNOR port to transmit information as to whether the first board is currently maintained in a normal state or in an abnormal state, to the second board;

a PAIRNOR port coupled to the CARDNOR port, the PAIRNOR port recognizing state information of the second board according to a signal received from the CARDNOR port; and

an MS port having information as to whether the first board is a master board or a slave board.

13.   (Canceled)

14.   (Original) The system of claim 12, wherein the first interface circuit comprises an A-bus interface.

15.   (Original) The system of claim 12, wherein the second interface circuit comprises a C-bus interface.

16.   (Canceled).

17.   (Previously Presented) The method of claim 1, wherein the first board is a master board and the second board is a slave board.

18.   (Canceled).

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19.   (Original) The method of claim 1, wherein the state information determines when

the second board is required to assume the active state.

20.   (Original) The method of claim 2, wherein the state of the MS port is determined

when the board is mounted to pins of a backboard of the ATM system.

21.   (Canceled)

22.   (Previously Presented) A method of controlling duplexing, comprising:

        recognizing state information of a first and second duplexing control board by

monitoring a plurality of input/output ports on each of the first and second duplexing

control boards, wherein the state information is provided to each of the first and second

boards through the input/output ports connecting the first and second duplexing control

board;

        forming transfer commands to transfer active authority from one of the first

and second control boards to the other control board;

        forming ATM cell information from data presently being processed in an active

one of the first and second control boards; and

switching the active authority from one of the first and second control boards to

the other control board based on the ATM cell information, wherein the ATM cell information

comprises a virtual path and a virtual channel, and wherein the virtual path is 0 and the virtual

channel is 0 when not switching the active authority and when updating information or changing

software during an operation of the first and second control boards.

23.   (Previously Presented) A duplexing control circuit, comprising:

an interface circuit to couple to an input/output bus;

a control circuit to maintain an active state of the duplexing control circuit based

on ATM cell data and state information; and

a plurality of input/output ports to transmit state information of the duplexing

control circuit, and receive state information from at least one other duplexing control circuit,

wherein the state information is provided to each of the duplexing control circuit and the at least

one other duplexing control circuit through the input/output ports coupling the duplexing

control circuit and the at least one other duplexing control circuit, wherein the duplexing control

circuit monitors state information of at least one other duplexing control circuit, and where a

state of the duplexing control circuit and the at least one other duplexing control circuit is one of

an active state and a standby state determined by a virtual path and a virtual channel indicated by

the state information.

24.   (Original) The circuit of claim 23, wherein the state of the duplexing control

circuit is one of an active state and a standby state, and wherein the duplexing control circuit

monitors state information of at least one other duplexing control circuit.

25.   (Previously Presented) A method for controlling duplexing in an ATM system, the

ATM system including a plurality of duplexing control boards connected to an input/output bus

and input/output ports for transmitting/receiving state information, comprising:

determining at least one master board and at least one slave board from among

the plurality duplexing control boards;

recognizing state information of an opponent board from information of the

input/output ports connecting the master board to the slave board, the duplexing control boards

being respectively maintained in an active state and a standby state, wherein the state information

is provided to each of the master board and the slave board through the input/output ports

connecting the master board and the slave board;

generating information to transfer an active authority, and forming data

information presently being processed into ATM cell information, when a switching of

duplexing of a board in the active state is necessary according to the recognized state

information; and

switching the duplexing according to the generated information and the formed

ATM cell information, wherein the ATM cell information comprises a virtual path and a virtual

channel, and wherein the virtual path is 0 and the virtual channel is 0 when the active authority is

not being transferred and when updating information or changing software during an operation

of the ATM system.

26.   (Currently Amended) An ATM system, comprising:

a slave board;

a master board; and

a number of signal lines connecting ports on the master board and slave board,

wherein the signal lines carry state information for switching duplexing between

the boards, wherein the state information indicates a virtual path and a virtual channel for

determining an active state and a standby state of the slave board and the master board, and

wherein the signal lines connecting the ports on the master board and slave board bypass a bus

carrying ATM cell data for the boards, and

<u>wherein the master board includes:</u>

<u>a first port to inform the slave board of whether the master board is in the active state or standby state;</u>

<u>a second port to receive information from the slave board indicating whether the slave board is in the active or standby state;</u>

<u>a third port to output a reset signal to the slave board; and</u>

<u>a fourth port to receive a reset signal from the slave board for resetting the master board.</u>

27.   (Previously Presented) The system of claim 26, wherein the number of signal lines is more than one.

28.   (Canceled)

29.   (Currently Amended) The system of claim 26, wherein the ~~state information includes a~~ reset signal <u>is received from</u> ~~for resetting~~ the <u>slave</u> ~~master~~ board when the master board switches to the standby state.

30.   (Canceled)

31.   (Previously Presented) The system of claim 26, wherein the slave and master

boards each include:

        a memory which stores the state information; and

        a controller which controls a duplexing state based on the state information.

32.   (Previously Presented) The system of claim 31, wherein, in each board, the

controller updates the state information stored in the memory to indicate a current duplexing

state of the board.

33.   (Previously Presented) The system of claim 31, wherein the controller of the slave

board monitors changes in state information stored in the memory of the master board.

34-38   (Canceled)

39.   (Currently Amended) A duplexing control method in an ATM system, comprising:

        receiving state information of a master board;

        storing the state information in a memory of a slave board; and

        switching a duplexing state of the slave board based on the state information,

wherein the state information indicates a virtual path and a virtual channel for determining the duplexing state and wherein the state information is transmitted through [[a]] pin-to-pin connections between the master and slave boards, said pin-to-pin connections bypassing a bus which is coupled to the master and slave boards for carrying ATM cell information, wherein said connections include:

a first connection to inform the slave board of whether the master board is in the active state or standby state;

a second connection to receive information from the slave board indicating whether the slave board is in the active or standby state;

a third connection to output a reset signal to the slave board; and

a fourth connection to receive a reset signal from the slave board for resetting the master board.

40.   (Previously Presented) The method of claim 39, wherein the duplexing state is one of an active state and a standby state.

41.   (Canceled)

42.   (Currently Amended) The method of claim 39, further comprising:

transmitting the [[a]] reset signal from the slave board to the master board

through said fourth connection when the state information indicates the master board has

entered a standby state.

43.   (Canceled)